

Pedagogical Strategies to “Shorten Distances”: An Online Course on Stain Removal for Textiles

Ir a versión en español

DOI: 10.30763/Intervencion.283.v1n27.62.2023 · YEAR 14, NO. 27: 282-293

Submitted: 20.12.2021 · Accepted: 05.04.2023 · Published: 30.09.2023

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ABSTRACT

In the field of South American textile conservation, the lack of courses in Spanish and the difficulty of connecting with other professionals in the international community are challenges faced in the attempt to update knowledge within the area. With this premise, the Comité Nacional de Conservación Textil (CNCT, National Textile Conservation Committee)—an institution that brings together professionals related to the conservation and investigation of the textile heritage of Chile and other countries of the Southern Cone—developed the initiative to organize a course on textile stain removal techniques with innovative application methods. This REVIEW presents the experience of the participants on such a course, titled *Disolver o remover para resolver. Curso virtual de conservación sobre la limpieza localizada en textiles (Dissolve or Remove to Resolve. Virtual Conservation Course on Localized Cleaning on Textiles)*.

KEYWORDS

textile conservation, stain reduction, gels, Spanish training course, pedagogical tools

INTRODUCTION

From September 7 to 16, 2021, Laura Mina¹ and Laura García Vedrenne,² textile conservators, both residing in the United States, offered a virtual theoretical-practical course focused on localized cleaning on textiles with gels and pads, which was shared by the Comité Nacional de Conservación Textil (CNCT, National Textile Conservation Committee). Although at the beginning it was intended to be given in person, the instability of the Chilean sociopolitical context, which started in 2019, and later, the coronavirus pandemic, in 2020, led the organization to a completely virtual format.

PREVIOUS CONSIDERATIONS

The field of textile conservation in Latin America faces problems and difficulties that often complicate—or even hold back—the training of professionals in the region. Language is one barrier that we as Latin Americans come up against, considering that a large amount of the specialized bibliography on textile conservation is written in English. Furthermore, the seminars and courses given by international organizations require fluency and full comprehension of the language.

Therefore, interest in creating this course arose; it was conceived in 2019 in London, at an academic meeting event between Francisca Campos (conservator partner of the CNCT) and Laura García Vedrenne. Within this context, the exchange of ideas and the common concern about the difficulty of accessing courses in Spanish in the field of textile conservation in Latin America became important. Precisely, it has to be considered that most of the bibliography on the subject is published in English, which sometimes results in the detriment of textile collections: pieces that do not receive the specialized treatments they require due to the lack of knowledge. This concern, raised by Francisca Campos, was acknowledged by Laura García Vedrenne, who, in an attempt to plan a course, contacted with specialist conservators. This is how one of them, Laura Mina, an American conservator, who has published some of the few articles on the topic of cleaning with gels (i. e. Mina, 2020), joined the project.

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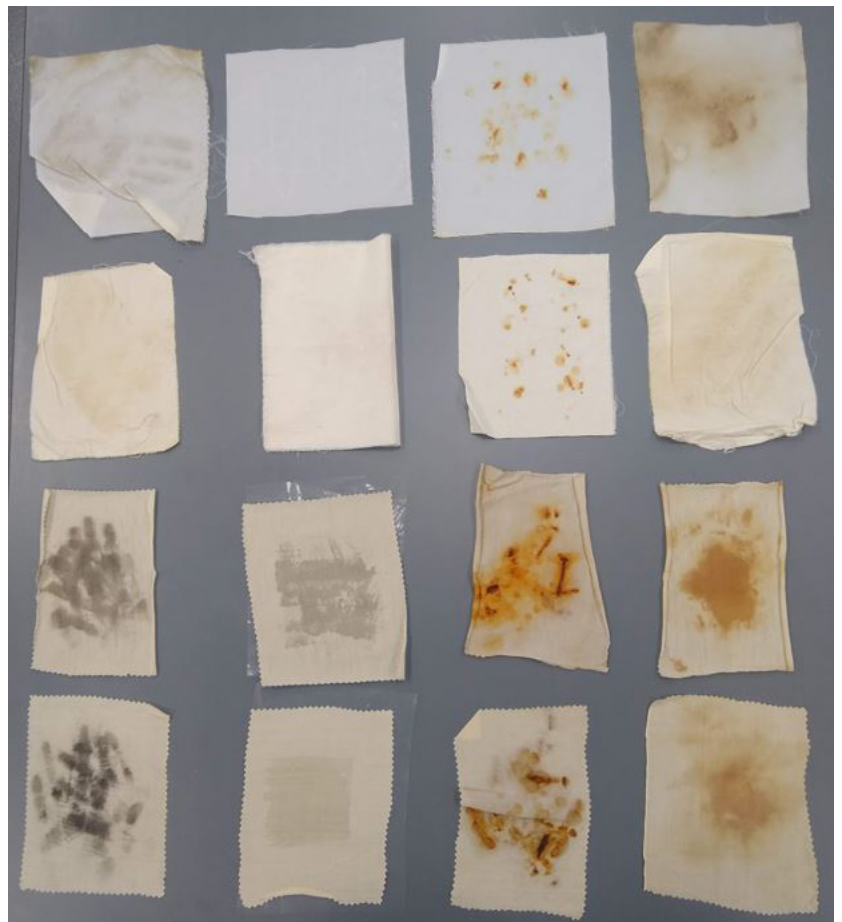
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Directed by García Vedrenne and Mina, the course was conceived as an instance of training-specialization in theory and with practical experimentation, accessible to the Spanish-speaking community of the Southern Cone. In this sense, the collaboration of Laura García Vedrenne was fundamental, both in the translation from English to Spanish of the contents prepared by Laura Mina—who, since she does not speak our language, could not teach the course by herself—and in the dictation of classes and simultaneous translation during each meeting.

ORGANIZATION

To guarantee that all participants experimented on the same basis, the enrollment included a kit of materials (Figure 1), consisting of stained cloths on which to carry out the experimentation and materials for applying cleaning solutions and gels. The search and acquisition of these in each locality also required effort, since it was essential to obtain experiences based on regional availability.

FIGURE 1. Set of stained fabrics
(Photograph: Francisca Campos, 2021; courtesy of the author).



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The instructors prepared and sent each participant a set of stained fabrics (Figure 1), with 16 samples in total, organized by type of stain: dirty water, tea or coffee, rust, and adhesive; also, it included four textile types: cotton, nylon, wool, and a mixture of silk and rayon. In addition, an organizing commission—consisting on members of the CNCT: Catalina Rivera and Francisca Campos in Chile, and Patricia Lissa and Ivana Rigacci in Argentina—was in charge of purchasing, preparing, and distributing the materials (Figure 2), as well as receiving and sending the sets of stained fabrics to the attendees from those two countries, plus Brazil.

FIGURE 2. Kit of materials (Photograph: Francisca Campos, 2021; courtesy of the author).



Two months before the beginning of the course, the instructors sent through Google Drive the link to a shared-access folder with key information so that the participants could anticipate the theoretical contents: syllabus, initial bibliography, and basic concepts.

PEDAGOGICAL STRATEGIES

The program, the content, and the dictation of the course were developed based on two fundamental premises: to use Spanish language, and to use the Zoom platform for the remote sessions. The resources were optimized to carry out practical experiences applying the theoretical contents.

Five synchronous theoretical sessions were proposed, with didactic material created by Laura Mina, translated into Spanish and dictated by Laura García Vedrenne, in combination with four asynchronous practice sessions that the participants would develop. A

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total of sixteen participants enrolled, half from Chile, seven from Argentina, and one from Brazil.

During the development of the classes, Laura García Vedrenne also assumed the role of moderator and simultaneous translator, mediating between Laura Mina and the participants by transmitting the questions and answers raised during the session. Thus, the interaction between the parties was very educational, since each one contributed from their knowledge and experiences, maintaining both a permanent willingness to clarify concerns, and a generous attitude when sharing their knowledge.

The themes were presented visually, dynamically, clearly, and schematically. In this regard, it is important to highlight the use of summary tables to graphically reinforce the most important concepts (Figure 3). The curriculum covered different thematic units: the physicochemical characteristics of textiles, types of stains and water; the description of stains and their analysis; cleaning systems, pH, and cleaning agents; stain solubility, and localized cleaning systems, gel preparation and their application.

FIGURE 3.
Schematization
of the contents
employing summary
tables (Scheme:
Laura Mina and
Laura García, 2021;
courtesy: CNCT).

Polarity and Solvents	High polarity Solvents	Medium polarity Solvents	Non-polar Solvents
	<ul style="list-style-type: none"> • Water • Ethanol • Alcohol (Denatured alcohol) • Acetone 	<ul style="list-style-type: none"> • Ethers • Esters • Ketone • Chlorinated hydrocarbons 	<ul style="list-style-type: none"> • Hydrocarbons: Stoddard solvent and white spirit • Turpentine
	Hydrogen bonds	Dipole forces	Van der Waals forces

The didactic approach of the course was very innovative because it used synchronous virtual tools for interaction, and files exchange among the attendees. It is important to mention that this added an extra difficulty due to the lack of familiarity with such tools. Such educational resources have been widely used in teaching work after the challenge posed by the health emergency, for which they constituted a great contribution. Next, the tools used will be mentioned. Firstly, Mentimeter.com is an online questions and surveys platform (Figure 4); secondly, Google Jamboard is an interactive virtual whiteboard that collects responses and comments, which allows synchronous group analysis and evaluation of the results of each activity. Another one is Google Forms, a tool with which it is possible to create and publish forms and view the results graphically. Finally, the already mentioned, Google Drive is

a shared-access folder to organize the collection of your materials in virtual format.

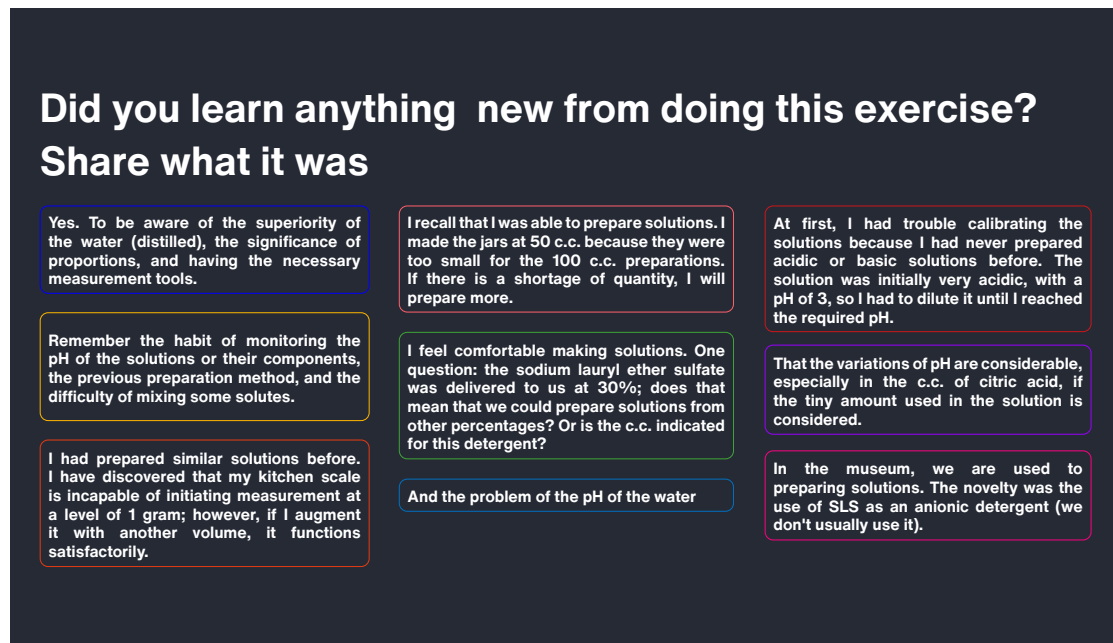


FIGURE 4. Interface graphic of the Mentimeter tool (Scheme: Laura Mina and Laura García, 2021: courtesy: CNCT).

SESSIONS AND PRACTICES

There were a total of five virtual sessions, accompanied by individual practice days.

On the first day, the theoretical class addressed the physico-chemical characteristics of fibers, yarns, fabrics, stains, water, aqueous cleaning, pH, and surfactant agents. It was reinforced the central idea that most stains have several components and polarities combined, whether they are proteins, sugars, tannins, oils, metals, or microorganisms.

A practical exercise was carried out for the analysis and description of stains called the *CAUSO* method, an acronym in Spanish which abbreviates the concepts of color, appearance, location, touch, and smell. This guideline allows to observe, describe, and infer possible causes and composition.

On the second day, solutions were prepared for practical exercises of localized cleaning with rotation with swabs, pads, and gels:

1. Anionic solution: Sodium lauryl ether sulfate (SLES) at 1%
2. Non-ionic solution: Triton X-100 at 1%
3. Acidic pH: Citric acid powder

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4. Alkaline pH: Baking soda
5. Acetone-water (1:1)
6. Ethyl alcohol-water (1:1)

On the third day, tests were carried out with two rigid gels (agarose and agar-agar) and a viscous one (xanthan gum), both at low and high concentrations. Each student made their preparations and then discussed in class the differences that they had observed in their density, viscosity, and transparency, among other aspects. The concentrations of the gels were the following:

1. Agarose gel at 2, 4, 6, 8%
2. Agar-agar gel at 1, 2, 3, 5%
3. Xanthan gum at 2, 4, 6, 8%

The following was concluded from the observations revealed by the participants regarding the preparation of the gels:

- There is no ideal time to prepare the gels in water bath. Instead, it depends on the concentration of the gel, the amount to be prepared, and the environmental temperature, among other factors.
- To remove rigid gel residues from the containers where they were prepared, it is recommended to wait for them to solidify and then remove them. In the case of viscous gels, it is proposed to remove the excess with a paper towel and then wash the bottle with water.
- Xanthan gum requires patience to break up the lumps; a good suggestion is to dissolve them with a spoon towards the walls of the jar. If it has been previously refrigerated, it is recommended to leave it at environmental temperature before using it.
- The coloration of agar-agar is more yellow than the one of agarose, due to its lower degree of purity. Its gelation requires taking sufficient time for the dilution of the flakes; otherwise, it becomes liquid.
- The thickness of the gel impacts the amount of solution it can hold, but not its penetration. If the gel is very thick, it can be turned around so that the fresh part is in contact with the textile.

Regarding the application of the gels, the participants inferred that:

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- It is recommended to apply the xanthan gum with a scraper and to remove the dirt through localized rotation. Residues are removed by rinsing, with the support of a suction table, or by immersion cleaning.
- The application of xanthan gum requires an interface due to its high viscosity.
- Xanthan gum is applied when greater contact with the textile is necessary for the solvent to penetrate the interstices of the fabric.
- Rigid gels do not necessarily have to remain static: they can also be moved with a brush on the surface to promote the action of the solvent.
- The minimum and maximum application times of a gel—depending on the object of the treatment—can vary from 1' to 1 hour. According to the experience of the instructors, one must always observe what is happening on the surface of the textile. Other processes can be combined in the treatment, to reduce the risks of exposure. For example, if the piece to be treated is a sampler, one could try a more daring treatment, since it is not a unique specimen.
- All gels are removed while they are still wet; otherwise, they generate an additional stain.
- The weight conveyed on the gel conditions the evaporation rate of the solution, but it does not have a major impact on the penetration into the tissue.

On the fourth day, the theoretical content addressed the use of enzymes and bleaching agents exemplified with treatment cases. For the practical activity of this block, the attendees were instructed to use a gel of agarose, agar-agar, and xanthan gum impregnated with pure water on the stained fabrics, and to evaluate the drying fronts according to the different concentrations. The instructors suggested that the impregnation time of the gels in the solutions could be 15' if it is a test, but in the case of a treatment, it can be left immersed overnight. It was recommended to use glass containers for ethanol, acetone, and citric acid, and apply surfactants with sponges or swabs.

ACTIVITY DISCUSSION

The instructors and participants exchanged their views on each of the activities carried out, which led to them issuing some considerations for the textile cleaning process, which are listed below:

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- Most washing stains occur during drying since it is the moment of greatest vulnerability of textiles. That is why, for instance, at the Victoria and Albert Museum (V&A, UK) tapestry washings take place during the summer.
- The question was raised about draining the gels prior to their application or placing them immediately after taking them out of the solution. It was suggested to control the dispersion of the solutions in order to avoid drying fronts, considering the variables of gel concentration, the use of blotting paper as a barrier, and the use of a suction table or ventilation with cold air.
- Rinsing is performed depending on the applied solution. If it is ethanol or acetone, they evaporate without leaving residues; chelants and enzymes can be removed—however, the chelating residues will be activated only if the textile is wet. Surfactants should always be rinsed off as they could attract more dirt due to their viscosity.
- It was suggested to carry out the drip rinsing technique with water by placing a towel under the textile, changing it as it gets wet. With the help of a brush you can “sweep” the dirt (feathering). It was also mentioned the possibility of swabbing the drying forehead stain while it is still wet.
- The results with citric acid on rust stains were not as expected. This is because this is a weak acid, so it was suggested to try a stronger chelator such as EDTA. An alternative for experimentation is to combine a chelator with a surfactant, since the former acts to break the bond and the latter promotes the removal of the stain.
- Regarding the gels, it was observed that, at a higher concentration, they gave better results, although it was necessary to add weight to them to increase contact with the surface.
- Environmental control interferes with the performance of the gels. If the T° is high and the RH is low, they will tend to dry even before acting on the stain.

RESULTS

The instructors devoted themselves to gathering information on the opinions and experiences of the participants in each of the instances of the course, through digital tools. This demonstrates a deep respect for the exchange and an assessment of the considerations of each party. That information was shared, reinforcing the quality and transparency of the shared experience.

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Certainly, the most valued aspect by the participants was the dedication of the instructors, both in terms of their warmth, and excellent willingness to share information and resolve doubts, as well as the simplicity with which they were able to explain complex topics, such as notions of structures and chemical interactions. The general feeling of the audience at the end of the course was one of gratitude, since the instructors were able to motivate and generate interest around new knowledge that should be expanded in the future. This is how one of the attendees mentioned it: “The information and practice they gave us were very important. The most valuable thing is that they presented us with materials and ways of working that give us solid tools to embark on a path that we must deepen with more practice, study, and experimentation. In addition to the classes, all the bibliographical material that they gave us was excellent”³ (Evaluation of the *Dissolve or Remove to Resolve Course*, September 16, 2021).

In the same way, the evaluation of the participants was very favorable in terms of organization, time management, quality of the presentations, and the challenge of the practical exercises proposed for the course, aspects that led to compliance with the provisions of the syllabus.

Furthermore, the virtual tools used to facilitate learning were also very well received by the attendees, especially inspiring for those who also teach because it allows them to expand their pedagogical resources in the classroom.

The practical exercises for describing stains (CAUSO), preparing solutions and gels, and performing gel tests on stained fabrics were successfully evaluated. The assistants feel empowered to apply the contents in their daily work.

In other regards, some aspects related to the practical exercises that could be perfected in a subsequent version of the course were also indicated. Some of these aspects refer to providing a more directed guide to carrying out the exercises, considering more time for their execution, and reducing the number of variables in practices. Other proposals were to incorporate a sample of oil or grease stain, as it is a frequent type of stain in textile collections, and to consider the costs associated with the use of certain materials in order to assess the feasibility of their application.

³ Editorial translation. All quotes are translations from the original texts in Spanish.

CONCLUSIONS

The *Dissolve or Remove to Resolve Course* had a long development path, with an important premise: to create training spaces in Spanish so that Spanish-speaking professionals have access to training in their mother tongue. This demanded that the organizing committee of the CNCT to search for the requested laboratory materials, realizing that Latin America conservation professionals can adapt to the available inputs and generating contact networks and ingenious solutions to fill their scarcities.

It should be noted that, although learning in a face-to-face course would have been more useful, given that there is more group interaction in the development of the practical exercises, the execution of the individual practice challenged individual skills, mainly because, for most of the attendees, these were new materials and procedures. This also encouraged the participants to self-teach new cleaning methods.

The experience proved to be very satisfying, interesting and enriching for all the participants, despite the adverse circumstances. Although the global political, social, and health context made it difficult to materialize the *Dissolve or Remove to Resolve Course* project, the instructors knew how to take advantage of the online tools and resources to work organically with the participants, and generate spaces for exchange and sharing among diverse groups.

Heritage textile cleaning treatments are always complex procedures that begin long before cleaning itself. Since presenting cleaning as a possibility, many variables must be taken into account, such as those reviewed in this course, which considerably broadened the bases for the analysis of the viability and relevance of the treatments. The exchange between peers during the learning process proved to be rich and productive since it started from similar professional and field realities. Hence, the conclusions and solutions constitute more achievable and doable options. The instructors, open to hearing about regional difficulties, contributed to the search for solutions in the field, a methodology, and new materials for the participants.

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SIDEBAR IMAGE.
Cleaning with 4%
agarose on dirty
water stains on
wool (Photograph:
Carolina Morales;
courtesy of the
author).